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REMARKS

This application pertains to a novel process for separating solids, such as catalysts, present in dissolved or colloidal form from solutions in a nonaqueous solvent with the aid of a membrane.

The membrane used in Applicants' process has a hydrophobic coating. The hydrophobic coating is produced on the membrane preferably by treatment with silanes (page 4, line 7). Suitable silanes are those of the general formula $R_1R_2R_3R_4Si$, preferably at least one but at most three of the groups R_1 to R_4 being hydrolyzable groups, e.g. -Cl, -OCH₃ or -O-CH₂-CH₃ and/or at least one but at most three of the groups R_1 to R_4 being nonhydrolyzable groups, e.g. alkyl groups or phenyl groups, and the nonhydrolyzable substituents preferably being capable of being at least partly fluorinated for increasing the hydrophobic effect.

Claims 1-17 are pending.

Claim 17 stands objected to because the Examiner views the expression "hPa" as being a typographical error. There is no error, however. The range of 2000 to 40 000 hPa is correct! The Examiner will note that 1 bar = 1000 hPa, so 2 to 40 bar is the pressure range claimed "hPa".

The objection to claim 17 should accordingly be withdrawn.

Applicants note with appreciation the Examiner's suggestion that the Brief Description of the Drawing be moved. However, the drawing relates to the Examples, and Applicants believe that in view of this, the present location of the Brief Description of the Drawing just prior to the Examples is the most appropriate location for it.

Regarding the Information Disclosure Statement, Applicants note that the Examiner has crossed-off EP 0 263 953 because no statement of relevance was included in the IDS. An English-language abstract was included in the IDS, however, and that certainly explains the relevance of the reference. It is therefore respectfully requested that the Examiner consider EP 0 263 953, and initial that reference on the accompanying copy of the original 1449 form.

Claims 1, 3-11, and 15-17 stand rejected under 35 U.S.C. 102(b) as anticipated by Tsuru et al ("Nanofiltration in Non-aqueous solutions by porous silica-zirconia membranes", J. Membrane Sci., 185(2001) 253-261).

The Tsuru reference comes as no surprise to Applicants, as this reference is already discussed in Applicants' disclosure, at page 2, lines 25-28.

As the Examiner sees it, this reference discloses a separation process using a membrane formed of a ceramic substrate and having a hydrophobic coating applied to it

by reaction with tetraethoxysilane. The Examiner refers specifically to page 254 of the reference.

A careful reading of the Tsuru reference reveals absolutely no teaching or suggestion of a membrane having a hydrophobic coating. In Tsuru an alumina microfiltration membrane is coated with a colloidal sol prepared by hydrolysis and condensation of tetraethoxysilane and zirconium tetra-n-butoxide in the presence of an acid catalyst. The coated membrane is then fired at 500°C. (page 254, Experiment 2.1). A silica-zirconia membrane is thus formed.

There is no surface treatment described by Tsuru; only the preparation of a hydrophilic silica/zircon membrane which is normally used for water separation by pervaporation or steam permeation - not exactly in nanofiltration which is the topic of the present invention and for which ceramic oxides and mixtures on the basis of Al_2O_3 , TiO_2 , ZrO_2 (metal oxides) and SiO_2 are used.

Tsuru says that the preparation results in a "relatively hydrophobic surface" (p. 256, l. 16) but this is in comparison to water and not verified by flow measurement of hydrophobic solvents. In any case, Tsuru refers to the properties of the membrane itself, and not to any coating.

The non-aqueous solvents mentioned by Tsuru, such as MeOH and EtOH are relatively hydrophilic, whereas the membranes according to the present invention permit flow of toluene and separation of PS and catalyst.

Moreover, Tsuru describes the properties of the membranes themselves; and does not teach or suggest the application of a hydrophobic coating, such as is required by Applicants' claims.

Coating with the reaction product of tetraethoxysilane and zirconium tetra-n-butoxide and firing to form a silica-zirconia membrane is different than treating a membrane with a silane. In addition, there is absolutely nothing in the reference that would suggest that the resulting coating or the silica-zirconia membrane formed from it is hydrophobic. Quite simply, no person skilled in the art reading the Tsuru reference would see Tsuru as applying a hydrophobic coating to a membrane. Tsuru forms a membrane, not a coating on a membrane.

As an aside, it should also be noted that the tetraethoxysilane used by Tsuru does not appear to fall within the structural formula given above.

The Tsuru reference has nothing in common with the claims of the present application, and Tsuru cannot fairly be seen as teaching or suggesting Applicants' novel process. The rejection of claims 1, 3-11, and 15-17 under 35 U.S.C. 102(b) as anticipated by Tsuru et al ("Nanofiltration in Non-aqueous solutions by porous silica-zirconia membranes", J. Membrane Sci., 185(2001) 253-261) should accordingly now be withdrawn.

Claims 1-8 and 10-17 stand rejected under 35 U.S.C. 102(b) as anticipated by WO 01/07157. This reference also comes as no surprise to Applicants, as it is already discussed at page 4, lines 22-24 of their specification.

Although the Examiner states that this reference concerns a membrane with a hydrophobic coating, a careful reading of the reference reveals absolutely no teaching or suggestion of any hydrophobic coating. As in the reference cited in the previous rejection, the WO reference describes a process for forming a membrane, but not one of coating any membrane with any hydrophobic substance. For example, at page 11, first full paragraph, the WO reference describes a process wherein a mixture of a polymeric material and a powdered metal are applied to the surface of a microporous support structure, and then sintered to burn off the polymer leaving the support coated with a thin subnanoporous layer of the metal. This "thin subnanoporous layer" of metal is, in fact, a membrane; not a coating on a membrane.

There are no hydrophobic coatings disclosed in this reference!

The rejection of claims 1-8 and 10-17 under 35 U.S.C. 102(b) as anticipated by WO 01/07157 should accordingly be withdrawn.

In view of the present remarks it is believed that claims 1-17 are now in condition for allowance. Reconsideration of said claims by the Examiner is respectfully requested and the allowance thereof is courteously solicited.

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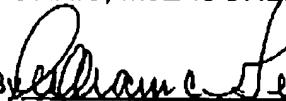
CONDITIONAL PETITION FOR EXTENSION OF TIME

If any extension of time for this response is required, Appellants request that this be considered a petition therefor. Please charge the required petition fee to Deposit Account No. 14-1263.

ADDITIONAL FEE

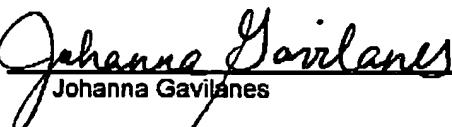
Please charge any insufficiency of fee or credit any excess to Deposit Account No. 14-1263.

Respectfully submitted,
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I hereby certify that this correspondence is being transmitted via facsimile no. 571-273-8300 addressed to Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on August 21, 2006


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